

CICADELLIDAE LEAFHOPPERS OF NEW HAMPSHIRE.*

PHILIP ROSEMOND LOWRY.

THE CICADELLIDAE OF CERTAIN PLANT ASSOCIATIONS IN NEW HAMPSHIRE.

From 1921 to 1927 the author has made frequent collections of Cicadallidae from four distinct ecological associations in the vicinity of Durham, N. H. Those collections cover the whole year and represent a rather complete census of the leafhopper fauna of these associations. After some study, representative areas were selected in each of the associations and the work was concentrated on these. None of the areas are over 2.5 miles from tide water, or over 100 feet above sea level.

Gray's *Manual of Botany* is followed for the plant names. The author is indebted to the late Dr. Mabel M. Brown for assistance in plant determinations.

*The studies of the leafhoppers of New Hampshire undertaken several years ago by Mr. Lowry contemplated extensive collections and habitat studies with faunistic comparisons of adjacent regions and with a view to use it as a doctorate dissertation in the Department of Entomology at the Ohio State University, of which Mr. Lowry was a graduate, receiving the Bachelor of Science degree in 1920 and Master of Science in 1921. He had made extensive collections and careful studies of certain ecologic regions with an exhaustive comparison of the New Hampshire fauna with that of adjacent territory, with the hope of early completion of the work which was interrupted by his untimely death, April 29, 1931.

In this work he had the advantage of correspondence and assistance from a number of specialists who will be found credited for certain help in the paper. After his death the notes were submitted to the writers for the purpose of assembling the available material for publication and there has been an effort to include so far as possible all of the records and discussion which had been carried to such a point as to be suitable for permanent record. For the most part the exact data as recorded by Mr. Lowry have been indicated with certain condensations to avoid duplication of records and locality citations and with indication by initials of the collectors he had given credit for specific records. The discussion of plant associations is presented in essentially the form in which the notes had been written up by Mr. Lowry and will be found to contain numerous valuable indications of ecological distribution for these insects. There can be no question that had Mr. Lowry lived to complete the study he would have prepared a most valuable contribution, especially with reference to ecological relations of the leafhoppers of the New England region as the notes and discussion of related faunae which had not been digested and written up in form for publication would certainly have added much to the material presented here.

The collecting was performed for the most part in the vicinity of Durham, N. H., and in the White Mountain region, consequently most of the records are from southern New Hampshire.

HERBERT OSBORN AND DWIGHT M. DELONG.

SALT MARSH.

This is a small salt marsh in an inlet of Great Bay, which is, at low tide, about half muck flat and half true marsh. A small tidal creek flows through the marsh, in which grow large masses of eel grass, *Zostera marina* L. and scattered sea lettuce, *Ulva*. *Fucus vesiculosus* grows in masses on a few rock masses projecting into the stream. Salt marsh grass, *Spartina glabra* Muhl. borders the stream and practically covers the muck flats with a pure stand. Most of the *Spartina* is partially submerged at high tide. Above the reach of ordinary tides, salt meadow grass, *Distichlis spicata* (L.), covers most of the area and mixed with it are clumps of black grass, *Juncus gerardi* Loisel. Scattered plants of the following species are also present: *Salicornia europaea* L., sea lavender, *Limonium carolinianum* (Walt.) Britton, seaside plantain, *Plantago decipiens* Barneoud, and toward the outer edge of the area, seaside goldenrod, *Solidago sempervirens* L. and *Spartina patens*, probably var. *caespitosa* (Eaton) Hitchc.

Surrounding the marsh are rough, bushy pastures and young, scrubby, mixed pine and hardwood stands.

The leafhoppers typical of this association are *Deltocephalus littoralis* Ball, rare on *Distichlis*; *Deltocephalus simplex* V. D. and *Hecalus lineatus* (Uhl.), both fairly common on *Spartina*, although the latter species is found inland on *Spartina*. Species collected in New Hampshire from this association only, but reported from other associations, are *Phlepsius ramosus* Baker and *Phlepsius fuscipennis* V. D., both rare on *Spartina patens*, and *Thamnotettix fitchii* V. D., rare on *Spartina glabra*. Other widely distributed species collected are *Draeculacephala mollipes* (Say) and *D. noveboracensis* (Fitch) often abundant; *Deltocephalus pascuellus* (Fall.), *Thamnotettix melanogaster* (Prov.), *Chlorotettix unicolor* Fitch and *Dikraneura fieberi* (Loew) fairly common; and *Gyponana octolineata* var. *striata* Burm., *Thamnotettix decipiens* Prov., *Cicadula sexnotata* (Fall.), *Platymetopius acutus* (Say) and *Euscelis cuneatus* S. & DeL. uncommon.

BOG.

This area is a small, but typical bog, surrounded on all sides by steep hills and known locally as "Spruce Hole." In the center is an open pond, advancing into which are leather leaf, *Chamaedaphne calyculata* and a sedge. Around the pond is a

zone containing the following: *Sphagnum*, leather leaf, cotton grass, *Eriophorum*; pitcher plant, *Sarracenia purpurea*; a sedge, round leaved sundew, *Drosera rotundifolia*; cranberry, *Vaccinium macrocarpon*; small plants of sheep laurel, *Kalmia angustifolia*, and pale laurel, *Kalmia palifolia*. Outside of this is a second zone in which the shrubs are large and have become dominant. The plants are the same, but the relative proportions have changed and there is in addition blueberry, *Vaccinium corymbosum*; small black spruce, *Picea mariana*; checkerberry, *Gaultheria procumbens*, and a fine, low sedge. Entirely surrounding the bog is a narrow third zone of close growing black spruce, 10 to 30 feet high, and growing among them creeping snowberry *Chiogenes hispidula*, goldthread *Coptis trifolia*, mosses and remnants of the preceding vegetation. Several cicadellids are characteristic of this association. *Cicadula pallida* Osb. common on sedge, *Euscelis striatulus* (Fall.) common on blueberry and *Euscelis humidus* (Osb.) not uncommon on blueberry, are confined to bogs in New Hampshire. *Platymetopius magdalensis* Prov. and its variety *cinnamoneus* Osb. common on blueberry, *Platymetopius fulvus* Osb. not common on blueberry, and *Erythroneura obliqua* var. ——— rare on sheep laurel, are regular inhabitants of bogs but have also been found on the same hosts in other associations. Other widespread species collected, of which *E. obliqua* is the commonest are: *Gyponana* var. *octolineata* var. *striata* Burm., *Scaphoidus productus* Osb., *Phlepsius collitus* Ball, *Thamnotettix decipiens* Prov., *Jassus olitorius* Say, *Balclutha punctata* (Thun.), *Dikraneura fieberi* (Loew), *Erythroneura obliqua* (Say) and its varieties *noevus* (Gill.) and *fumida* (Gill.) and *Erythroneura maculata* (Gill.). *Oncopsis sobrius* (Walk.) was taken rarely, but is probably a stray from surrounding birches.

WHITE PINE-HEMLOCK FOREST.

This lies in the University forest which consists of about 50 acres of old growth white pine and hemlock. The area studied is almost entirely made up of large trees of *Pinus strobus* and *Tsuga canadensis*, with an occasional *Betula lenta* or *Fagus grandifolia*. Where the stand is undisturbed there is little undergrowth, the commonest plant being *Mitchella repens*. In small openings caused by windfalls, there is a rich flora, of which the following, representing a little over half the species observed are the most important:

SMALL TREES AND SEEDLINGS.

Betula leuta.
Tsuga canadensis.
Pinus strobus.
Fagus grandifolia.
Acer rubrum.
Quercus alba.
Quercus rubra.
Tilia americana.
Fraxinus americana.
Acer saccharum.
Betula lutea.

SHRUBS.

Taxus canadensis.
Lonicera canadensis.
Corylus rostrata.
Rubus triflorus.
Rubus idaens acutestissimus.
Rubus.
Diervilla lonicera.
Cornus alternifolia.
Viburnum acerifolium.
Viburnum dentatum.

HERBS.

Polypodium vulgare.
Phegopteris dryopteris.

Polystichum acrostichoides.
Aspidium spinulosum intermedium.
Lycopodium lucidulum.
Lycopodium clavatum.
Lycopodium obscurum.
Lycopodium complanatum.
Clintonia borealis.
Smilacina racemosa.
Oakesia sessilifolia.
Epipactis pubescens.
Hepatica triloba.
Maianthemum canadense.
Anemone quinquefolia.
Coptis trifolia.
Aralia nudicaulis.
Chimaphila umbellata.
Cornus canadensis.
Pyrola chlorantha.
Pyrola elliptica.
Monotropa uniflora.
Gaultheria procumbens.
Trientalis americana.
Mitchella borealis americana.
Epigaea repens.
Aster acuminatus.
Aster, spp.
Solidago, spp.

In addition there are scattered bunches of grasses and sedges and the drier spots often have *Cypripedium acaule*. In a single quite moist, open area is found *Sambucus racemosa*, *Rubus hispidus*, *Impatiens biflora*, *Viola incognita* and *Viola conspersa*.

This seems to be a temporary climax in this region. In the deeper, moist, richer soil a mixed stand occurs with a high percentage of hardwoods which is probably the true climax. The ground cover is dominated by herbs and shrubs of the northeast evergreen forest type. The common occurrence of many southern forms over this region is probably due to invasions following the settling and clearing of the country.

Leafhoppers are not particularly abundant in this association, the vegetation in the openings yielding most of them.

Thamnotettix belli (Uhl.) and its variety *brunneus* Osb. rare on shrubs and *Eupteryx vanduzeei* Gill. not uncommon on wood fern, have been taken in New Hampshire in this association only. *Pagaronia tripunctata* Fitch, common on *Mitchella*, and *Thamnotettix morsei* Osb. rare on shrubs (oak?) are more common here than elsewhere in New Hampshire. All the remaining species taken are common and widespread, as numerous or more so, in other associations. *Oncopsis variabilis* (Fitch), *Oncopsis sobrius* (Walk.) and *Empoasca* sp. were fairly common on sweet birch. *Eupteryx flavoscuta* Gill. and

its varieties *juvenis* McA., *clavalis* McA. and *nigra* Osb. were common on wood fern, as were also nymphs and adults of *Graphocephala coccinea* (Forst.). The adults of the latter species were also common on other shrubs and herbs. *Platymetopius magdalensis* Prov. was rare on *Vaccinium pennsylvanicum*. *Cicadula slossoni* V. D. was common on *Impatiens*. The following species were taken on grasses and sedges: *Agallia novella* (Say) and *Balclutha punctata* (Thun.) fairly common, *Dikraneura fieberi*, rare, *Agallia 4-punctata* (Prov.) and *Cicadula sexnotata* (Fall.) not common, and *Chlorotettix balli* Osb. rare. General sweeping of herbs and shrubs yielded the following: *Scaphoideus productus* Osb., *Erythroneura maculata* Gill., *Erythroneura obliqua* (Say) with its varieties *noevus* (Gill.), *fumida* (Gill.) and *parma* McA., common; *Scaphoideus auronitens* Prov., *Scaphoideus scalaris* V. D., *Scaphoideus immistus* Say, *Gyponana octolineata striata* Burm. and *Thamnotettix kenicotti* (Uhl.) fairly common; *Platymetopius acutus* (Say), *Jassus olitorius* Say, *Empoasca birdii* Goding, *Mesamia vitellina* (Fitch) and *Erythroneura comes* var. *vitifex* Fitch and variety *rubra* (Gill.) rather rare.

DRY, SANDY UPLANDS.

This area is a level, well drained glacial outwash with very sandy, dry soil. The whole area is covered with clumps of *Andropogon scoparius* and irregularly scattered throughout are pitch pines, *Pinus rigida*, from one to thirty feet high, occurring in groups or singly. There are also a few small, scattered gray birch, *Betula populifolia* and white pine, *Pinus strobus*. Scattered through the dominant *Andropogon* are the following: *Aristida gracilis*, *Rubus villosus*, *Potentilla pumila*, *Aster linariifolius*, *Aster* sp., *Solidago* two spp., a sedge, *Potentilla argentea*, *Lysimachia quadrifolia*, *Rumex acetosella*, *Hypericum perforatum*, *Antennaria canadensis*, *Fragaria virginiana*, reindeer moss (*Cladonia*).

Complete clearing, and cultivation, followed by periodical fires, probably account for this type of association. This is a xerophytic association of high temperature and having both prairie and heath aspects. A number of southern and prairie leafhoppers are restricted to this association in New Hampshire or are found in greatest numbers here.

At the edges of the area the dewberry increases, *Myrica asplenifolia* is common, and the following appear: *Pteris aquilina*, *Rhus copallina* and *Vaccinium vacillans*.

The following have been collected from the pitch pine: *Paracoelidea tuberculata* Baker, abundant, *Phlepsius graniticus* O. & L. and *Platymetopius angustatus* Osb., common, *Thamnotettix* n. sp. (near *perspicillatus*), rare, and *Gyponana octolineata tenella* Spbg., rare. The foregoing have been taken on this host only. *Empoasca coccinea* (Fitch) is common, but occurs on other pines elsewhere. *Phlepsius carolinus* Lathrop and *Phlepsius tullahomi* DeL. are found, but are much more common in the herb stratum. Widespread species not commonly taken are *Mesamia vitellina* (Fitch), *Scaphoideus immistus* (Say) and *Thamnotettix kennicotti* (Uhl.).

The following species have been taken on the *Andropogon* and associated plants: *Deltocephalus sandersi* Osb., abundant on *Andropogon*, *Phlepsius tullahomi* DeL. is common, *Parabolocratus flavidus* Sign. is fairly common, *Prairiana cinerea kansana* Ball, *Aligia modesta* (O. & B.) and *Deltocephalus caperatus* Ball are rare. All the above have been taken in New Hampshire in this association only. The following are commonest in this association in New Hampshire: *Deltocephalus unicoloratus* G. & B., abundant, *Phlepsius carolinus* Lat. and *Acinopterus acuminatus* V. D. fairly common, and *Driotura gammaroides* (V. D.) rare. The following are of more or less common occurrence: *Deltocephalus melsheimerii* (Fitch), *Deltocephalus configuratus* Uhl., *Deltocephalus misellus* Ball, *Deltocephalus compactus* O. & B., *Deltocephalus sayi* (Fitch) and *Aconura acuticauda* (Baker). Species rarely taken are *Deltocephalus oblectus* O. & B., *Xestocephalus pulicarius* V. D., *Platymetopius acutus* (Say), *Eutettix cinctus* O. & B., *Chlorotettix unicolor* (Fitch) and *Erythroneura maculata* Gill.

ABBREVIATIONS.

The names of collectors credited in the following records are indicated by initials as follows:

- E. D. B.—E. D. Ball.
- J. C. B.—J. C. Bridwell (N. H. Agr. Exp. Sta. Coll.).
- R. A. C.—R. A. Cushman (N. H. Agr. Exp. Sta. Coll., Bost. Soc. Nat. Hist.).
- D. M. D.—D. M. DeLong.
- W. F. F.—W. F. Fiske (N. H. Agr. Exp. Sta. Coll.).
- C. W. J.—C. W. Johnson (Bost. Soc. Nat. Hist.).
- J. C. K.—J. C. Kendall (N. H. Agr. Exp. Sta. Coll.).
- W. L. M.—W. L. McAtee.
- A. T. S.—Mrs. Annie Trumbull Slosson.
- J. S.—J. Smith (N. H. Agr. Exp. Sta. Coll.).
- M. J. S.—M. J. Smith (Woodman Institute Coll.).
- L. W. S.—L. W. Swett?

RECORDS OF COLLECTIONS

- Agallia novella* (Say). Dover, July 19, 1922; Durham, June 5, 29, July 7, 8, 14, August 27, 1922, June 23, July 18, August 11, 1923, May 14, 1924, May 16, June 12, 1925; Franconia, August 2, 1930; Hill, July 23, 1923; Mt. Clinton, July 30, 1900 (W. F. F.); Mt. Washington, reported for alpine region at or above 5,500 ft. (A. T. S., 1895), July 4, 1914 (C. W. J.); White Mountains, July 26, 1900 (W. F. F.); Wonalancet, July 17, 1930.
- Agallia quadri-punctata* (Provancher). Reported for State (O. & B., 1898); Durham, May 26, 1899 (W. F. F.), June 5, 6, July 8, 1922; May 31, June 5, 23, July 2, 1923, June 12, 1925; Hanover, June 8, July 18, 1892 (C. M. W.); Jaffrey, June 15, 1917 (C. W. J.); Mt. Clinton (near summit), July 30, 1900 (W. F. F.); Raymond, July 13, 1930.
- Agallia sanguinolenta* (Provancher). Dixville, September 9, 1930; Durham, September 8, 13, 22, 30, 1921, March 15, June 5, July 7, 11, 21, August 29, October 2, 5, 1922, May 7, July 18, 27, September 11, 1923; Hill, July 23, 1923; Mt. Washington (summit), September 3, 1925; North Hampton, September 13, 1922; Portsmouth, September 3, 1922; Twin Mountains, July 28, 1900. Common in meadows.
- Idiocerus amabilis* Ball. Durham, August 19, 1927, from willow, (det. E. D. B.).
- Idiocerus pallidus* Fitch. Durham, July 9, 1898 (W. F. F.), August 18, 1899 (R. A. C.), September 13, 1921, August 29, September 7, 14, 21, 1922, July 5, 27, 1923; Franconia, August 2, 1930; Hanover, July 28, 1892 (C. M. W.); Hill, July 23, 1923; Mt. Washington, reported for alpine region (A. T. S., 1895); Twin Mountain, July 28, 1900 (W. F. F.); Webster, July 17, 1900 (W. F. F.); Wonalancet, July 17, 1930. Common on willow.
- Idiocerus suturalis* Fitch. Durham, July 6, 9, 1925; Franconia, August 2, 1930; Lee, September 9, 1928, August 7, 1930; Mt. Washington, reported for alpine region (A. T. S., 1895); reported (O. & B., 1898); Newmarket, July 23, 1930; Rochester, July 10, 1930; Rockingham, August 21, July 7, 1928. On small-toothed aspen.
- Idiocerus suturalis* var. *lunaris* Ball. Durham, July 6, 9, 1925; Franconia, August 2, 1930; Lee, July 7, 1928; Rochester, July 10, 1930; Rockingham, August 21, July 7, 1928; Twin Mountain, July 28, 1900 (W. F. F.); Webster, July 17, 1900 (W. F. F.). On small-toothed aspen.
- Idiocerus suturalis* var. *vagus* Ball. Mt. Washington, reported for alpine region (A. T. S., 1908).
- Idiocerus duzei* Provancher. Reported for State (O. & B., 1898); Durham, July 23, 1921; Franconia (A. T. S.), reported (O. & B., 1898).
- Idiocerus alternatus* Fitch. Durham, July 20, 1898 (W. F. F.), April 19, May 16, 1900, July 9, 1923; Franconia (A. T. S.), reported (O. & B., 1898). On willow.

- Idiocerus productus* Gillette and Baker. Mt. Washington, reported for alpine region (A. T. S., 1906).
- Idiocerus formosus* Ball. Mt. Washington, reported for alpine region (A. T. S., 1906).
- Idiocerus lachrymalis* Fitch. Occurs wherever *Populus tremuloides* is present.
- Idiocerus provancheri* Van Duzee. Isles of Shoals, August 2, 1928 (*Pyrus arbutifolia*); Pinnham Notch (Glen House), July 23, 1915 (C. W. J.), July 21, 1922 (J. A. C.); Mt. Monadnock, September 6, 1906; Mt. Washington, reported for alpine region (A. T. S., 1896), (A. T. S.), reported (O. & B., 1898).
- Idiocerus fitchi* Van Duzee. Durham, July 9, 1899, in trap lantern (W. F. F.); July 20, 22, 1921, July 11, 1922; Nashua, August 11, 1924; Wilton, August 11, 1927. On apple.
- Macropsis virescens* (Gmelin). Durham, July 2, 5, 9, 27, 1923; Rye, July 25, 1928. Common on willow.
- Macropsis virescens* var. *graminea* (Fabricius). Durham, July 2, 5, 9, 27, 1923; Rye, July 25, 1928. Common on willow.
- Macropsis viridis* (Fitch). Durham, July 11, 1898 (W. F. F.), July 11, 1922, June 23, July 5, 9, 27, August 11, 1923; Farmington, July 6, 1923; Franconia, August 2, 1930, on willow.
- Macropsis suturalis* (Osborn and Ball). Durham, July 5, 27, 1923; Rye, July 25, 1928. On willow.
- Macropsis basalis* (Van Duzee). Durham, July 8, 1922, July 9, 1923, July 19, 1925; Exeter, July 9, 1925; Lee, August 7, 1930; Wonolancet, June 20, 1930. On small-toothed aspen.
- Macropsis basalis* var. *fumipennis* Gillette and Baker. Durham, July 19, 1925, on small-toothed aspen.
- Macropsis canadensis* (Van Duzee). Durham, July 5, 27, 1923. On willow.
- Macropsis bifasciata* (Van Duzee). Durham, July 9, 27, 1923, July 19, 1925; Exeter, July 9, 1925; Farmington, July 6, 1923; Newmarket, July 23, 1930. On large- and small-toothed aspen.
- Macropsis trimaculata* (Fitch). Durham, July 26, 1924, common on a few plum trees in Uni. plum orchard; cast nymphal skins found on underside of leaves; no apparent injury to infested trees.
- Macropsis sordida* (Van Duzee)? Durham, July 6, 1925. On quaking aspen. (Do not fit description, are probably what has been called *sordida* in the East; perhaps a new species.)
- Oncopsis variabilis* (Fitch). Common on birch. Taken at Alton, Bretton Woods, Crawfords, Durham, Epping, Fabyans, Hill, Mt. Washington, Pinkham Notch.
- Oncopsis sobrius* (Walker). Durham, July 10, 11, 1898 (W. F. F.), June 5, 1922, July 7, June 23, July 1, 18, 27, 1923; Epping, June 27, 1898 (W. F. F.); Farmington, July 6, 1923; Hanover, July 21, 1892 (C. M. W.); Hill, July 23, 1923; Mt. Washington, (A. T. S., 1894), alpine region at or above 5,500 feet; Osaipee, July 11, 1929; Rye, August 9, 1929. On birch.

- Oncopsis cognatus* (Van Duzee). Mt. Washington, reported for alpine region (A. T. S., 1902).
- Oncopsis fitchi* Van Duzee. Alton, July 4, 1927; Mt. Clinton (summit), July 30, 1900 (W. F. F.); (near summit), July 26, 30, 1900 (W. F. F.); Mt. Washington, reported for alpine region (A. T. S., 1896), July 24, 1900 (at base), (W. F. F.); White Mountain (alpine summits of Presidential Range), July 26, 28, 31, 1900 (W. F. F.). On birch.
- Oncopsis pruni* (Provancher). Durham, July 17, 1898 (W. F. F.), July 7, 8, 18, 21, 1922, July 18, 27, 1923, July 6, 1925; Epping, June 27, 1898 (W. F. F.); Hill, July 23, 1923; Mount Washington, reported (A. T. S., 1894) for alpine region; White Mountains, "subalpine" (Scudder), reported by E. P. Van D., 1890. Common on birch.
- Oncopsis minor* (Fitch). Reported for State in Van Duzee's Cat.; Jackson, September 18, 1927, on yellow birch.
- Oncopsis nigrinasi* (Fitch). Durham, July 15, 20, 1898 (W. F. F.), June 24, 1899 (J. C. K.), June 29, July 2, 7, 14, 1922 (R. A. C.), July 9, 1923, July 8, 1928. Common on hop hornbeam.
- Oncopsis fagi* (Fitch)? Durham, July 20, 1898 (W. F. F.), July 8, 1922. From hornbeam and river beech. (The above two specimens may not be the *fagi* of Fitch, but they are surely a distinct species.)
- Oncometopia lateralis* (Fabricius). Durham, August 18, 1899 (R. A. C.), September 18, 1921, June 14, 1924, September 4, 1927; Littleton, September 9, 1895 (C. M. W.); Mount Washington, reported (A. T. S., 1894); Nottingham, October 9, 1898 (W. F. F.), September 4, 1927; Pinnham Notch (Glen House), September 22, 1907 (C. W. J.); Twin Mountain, July 28, 1900 (W. F. F.).
- Cicadella gothica* (Signoret). Common at all localities collected, especially in roadside vegetation.
- Cicadella gothica* var. *atra* Barber. Durham, September 16, 1921, on wild rose, October 2, 1922.
- Kolla bifida* (Say). Durham, September 4, 1897 (W. F. F.), August 30, September 1, 8, 14, 23, 26, October 2, 1922, August 1, 11, 1923; Hanover, August 2, 1892, August 18, 1892 (C. M. W.); reported for State (Ball, 1901); Nottingham, September 4, 1927; Portsmouth, September 3, 1922; Webster, August 4, 1898 (W. F. F.); Wonalancet, September 27, 1930. In wet meadows, pastures, grass in low woods and along roadside.
- Helochara communis* Fitch. Durham, May 26, 1899 (W. F. F.), March 15, sifted from leaves, March 16, 1902 (R. A. C.), September 22, 1921; May 11, September 1, 7, October 2, 5, 1922, May 7, July 27, 1923; Dover, May 15, 1922 (flew into automobile); Littleton, September 9, 1895 (C. M. W.); Mount Washington, reported from alpine region (A. T. S., 1894); North Hampton, September 13, 1922; Nottingham, October 9, 1898 (W. F. F.); Portsmouth, September 3, 1922. Common on swamp grasses and sedges.
- Graphocephala coccinea* (Forster). Common at all localities collected, especially in undergrowth of woods or along roadsides.
- Graphocephala coccinea* var. *teliformis* (Walker). Crawfords, July 26, 1900 (W. F. F.), near summit of Mt. Clinton; Durham, July 23, 1921.

- Draeculacephala angulifera* (Walker). Jefferson, September 18, 1927, in wet woods.
- Draeculacephala manitobiana* Ball. Durham, September 14, 1921, July 25, 1925; Jefferson, September 18, 1927, in wet meadow.
- Draeculacephala mollipes* (Say). Common everywhere on grasses and sedges of moist meadows and woods.
- Draeculacephala noveboracensis* (Fitch). Durham, July 20, 1922, September 1, 21, 1922, July 28, 1924; Hampton, July 16, 1930; Hanover, July 21, 1892; Littleton, September 9, 1895 (C. M. W.); Lee, August 7, 1930; Portsmouth, September 3, 1922. Common on swamp grass.
- Pagaronia* (Kolla) *tripunctata* (Fitch). Durham, September 4, 1897 (W. F. F.), August 30, September 7, 23, October 14, 1922, August 11, 1923; reported for State (E. D. B., 1901). On *Mitchella repens* and *Gaultheria procumbens*.
- Evacanthus acuminatus* (Fabricius). Fabyans, July 24, 1900 (W. F. F.); Mt. Washington, reported for alpine region (A. T. S., 1902), July 24, 1915 (W. W. J.); Pinkham Notch, Glen House, July 18, 20, 1915 (C. W. J.); White Mountains, July 31, 1900 (W. F. F.); Wonalancet, July 1, 17, 1930.
- Penthimia americana* Fitch. Durham, May 20, 1898, May 26, 1899 (W. F. F.); Farmington, July 6, 1923; Jaffrey, June 8, 1920 (C. W. J.). on gray birch.
- Gyponana octolineata* var. *octolineata* Say. Durham, September 14, 1921, August 29, September 7, 1922; Newmarket, November 1, 1897 (J. S.); Nottingham, October 9, 1898 (W. F. F.).
- Gyponana octolineata* var. *cana* Burmeister. Durham, September 28, 1897, July 7, 1899, trap lantern (W. F. F.), Aug. 9, 1899 (R. A. C.), September 14, 15, 1921; Jackson, Pinnham Notch, September 18, 1927; Mt. Clinton, July 30, 1900 (W. F. F.); Wonalancet, July 17, 1930.
- Gyponana octolineata* var. *striata* Burmeister. Common in all places where collecting was done, especially in roadside vegetation.
- Gyponana octolineata* var. *tenella* Spangberg. Durham, August 11, 1923, from pitch pine; Pelham, August 31, 1905 (J. C. B.).
- Gyponana rugosa* Spangberg. Nottingham, September 4, 1927, from white oak.
- Gypona unicolor* Stal. Dover, September 16, 1924 (M. J. S.); Durham, August 15, 1899 (R. A. C.), September 8, 1921, September 11, October 3, 1922; Portsmouth, September 3, 1922. From coarse grass in swampy areas.
- Prairiana cinerea* var. *kansana* Ball. Durham, July 6, 1925 (Det. E. D. B.). From *Andropogon* in sandy area among scattered pitch pines.
- Ponana scarlatina* var. *scarlatina* Fitch. Durham, June 6, 28, July 9, 12, 1899, from trap lantern (W. F. F.), September 4, 1923, at light in room.
- Xerophloea major* Baker. Lee, June 28, 1928, from coarse grass on lake shore.

- Stroggylocephalus agrestis* (Fallen). Mt. Washington, reported from alpine region (A. T. S., 1906).
- Acucephalus nervosus* (Schränk.). Durham, July 10–September 23, 1922, June 23, July 1, 18, August 11, 1923; Franconia, August 2, 1930; Hill, July 23, 1923; Isles of Shoals, July 15, 1928, July 23–28, 1929; Lee, September 9, 1928, August 7, 1930; Portsmouth, September 3, 1922; Wonalancet, September 27, 1930. Common in grass in meadows.
- Acucephalus albifrons* (Linnaeus). Dover, July 19, 1922; Durham, August 6, 1900 (W. F. F.), July 21, September 1, 11, October 2, 1922, July 27, August 11, 1923, July 16, 1929, July 12, 1930; Hampton, July 16, 1930; Isles of Shoals, July 27, 1929; Mt. Washington, reported for alpine region (A. T. S., 1906); Rye, July 25, 1928; Waterville, October 2, 1898 (W. F. F.). Common in meadows.
- Xestocephalus pulicarius* Van Duzee. Durham, August 29, 30, September 8, 14, 1922; Newmarket, August 31, 1922; Nottingham, September 4, 1927; Portsmouth, September 3, 1922. Common in swampy meadows and grass along roadside.
- Xestocephalus superbus* (Provancher). Concord, August 12, 1929; Durham, August 29, September 21, October 2, 1922; Newmarket, August 31, 1922; Nottingham, September 4, 1927; Wonalancet, September 27, 1930.
- Hecalus lineatus* (Uhler). Durham, September 14, 1921, September 1, 1922, September 7, 1927; Hampton, July 16, 1930, from tall coarse grass at edge of salt marsh.
- Parabolocratrus viridis* (Uhler). Reported for State in Van Duzee's Cat. Hem.
- Parabolocratrus major* Osborn. Hill, June 23, 27, 1923, from meadow.
- Parabolocratrus flavidus* Signoret. Durham, September 13, 15, 1924 (Det. E. D. B.), August 18, 1927.
- Aligia modesta* (Osborn and Ball). Durham, September 6, 1924 (Det. E. D. B.). Pitch pine barren.
- Mesamia vitellina* (Fitch). Durham, September 4, 1897 (W. F. F.), August 1, 1898 (W. F. F.), July 11, 14, September 8, October 2, 1922, July 1, 1923; Hill, July 23, 1923; Isles of Shoals, July 26, 1929; Lee, August 12, 1930; reported for State (Slosson—coll.) (E. D. B., 1907); Nottingham, September 4, 1927; Raymond, July 13, 1930. From shrubs.
- Scaphoideus auronitens* Provancher. Durham, July 24, September 13, 15, 16, 22, 30, 1921, August 27, 30, September 8, 25, October 14, 1922. A common species on undergrowth in open woods.
- Scaphoideus jucundus* Uhler. Durham, September 21, 1922, August 28, 1924; Ossipee, September 17, 1927 (Det. E. D. B.). Swept from bushes along roadside.
- Scaphoideus scalaris* Van Duzee. Durham, August 27, 29, 30, September 14, 23, October 2, 14, 1922; Newmarket, August 31, 1922; Mt. Washington, recorded for alpine region (A. T. S., 1902).
- Scaphoideus lobatus* Van Duzee. Durham, September 15, 1921, October 2, 1922; Portsmouth, September 3, 1922; Mt. Washington, reported for alpine region (A. T. S., 1902).

- Scaphoideus ochraceus* Osborn. Recorded for State in V. D. Cat. Hem.; Durham, record (H. O., 1911).
- Scaphoideus productus* Osborn. Lee, August 12, 1930; Raymond, July 14, 1930; Rochester, July 10, 1930; Wonalancet, July 17, 1930. In heath-shrub association.
- Scaphoideus carinatus* Osborn. Hanover, one female used in original description (H. O., 1900); Center Harbor, September 10, 1914 (C. W. J.); Jackson, September 18, 1927. From shrubs at edge of woods or along road.
- Scaphoideus intricatus* Uhler. Franconia (A. T. S.), reported (H. O., 1911).
- Scaphoideus immistus* (Say). Dublin, August 20; Mt. Washington, reported for alpine region (A. T. S., 1902); Pinkham Notch, Glen House, July 15, 1915 (C. W. J.); Wonalancet, July 17, 1930. Common.
- Scaphoideus immistus* var. *minor* Osborn. Durham, August 29, 1922, from white pine.
- Scaphoideus melanotus* Osborn. Durham, July 11, 1922.
- Platymetopius acutus* (Say). An abundant species in the State on grass in meadows, pastures, swamps, on sedges, blueberry, ferns, willow, dogwood, etc.
- Platymetopius cuprescens* Osborn. Twin Mountain, July 28, 1900 (W. F. F.).
- Platymetopius angustatus* Osborn. Durham, September 6, 15, 1924, August 18, 1928; Madbury, September 5, 1927; Nottingham, September 4, 1927; Lee, August 18, 1927; Ossipee, September 17, 1927. Common on pitch and red pine.
- Platymetopius fulvus* Osborn. Durham, September 16, 1921, August 30, September 23, 1922, September 19, 1924. On blueberry.
- Platymetopius frontalis* Van Duzee. Webster, August 4, 1898 (W. F. F.).
- Platymetopius magdalensis* Provancher. Durham, July 14, August 29, September 7, 8, 21, 23, 1922, July 1, 18, August 11, 1923; Hill, July 23, 1923; Lee, August 12, 1930; Raymond, July 13, 1930; Rochester, July 10, 1930; Wonalancet, July 17, 1930. Common on blueberry.
- Platymetopius magdalensis* var. *cinnamoneus* Osborn. Concord, August 12, 1929; Durham, August 29, 30, September 8, 23, 1922, July 1, 1923; Rochester, July 10, 1930; Wonalancet, July 17, 1930. Common on blueberry.
- Flexamia sandersi* (Osborn). Durham, August 29, September 8, 21, October 2, 1922, July 1, 1923, August 28, September 6, 1924; Farmington, July 6, 1923, October 2, 1924; Lee, August 7, 1930; Newmarket, August 31, 1922; Rochester, July 10, 1930. Common on Andropogon.
- Flexamia deflector* (Sanders and DeLong). Durham, July 14, 1922, July 18, 1923, from short, fine grass in shady woods, August 11, 1923. (Weed—coll.) Reported by D. M. DeLong, 1926. The species referred to by Osborn and Ball as *D. bilineatus* G. & B., "collected in N. H. by Professor Weed" (1897) probably refers to this species; as does also the specimen called *D. productus* Walk. by Osborn (1915), collected at Hanover (C. M. W.).

- Latulus configuratus* (Uhler). Durham, June 1, 2, July 5, 18, 1923, May 22, 1925; Farmington, July 6, 1923; Franconia, August 2, 1930; Hill, July 23, 1923; Lee, June 28, 1928; Mt. Washington, reported from alpine region by A. T. S., 1894, July 4, 1914 (C. W. J.); Webster, July 18, 1900; White Mountains, July 30, 1900 (W. F. F.); Wonolancet, June 20, 1930. Common in dry areas on Andropogon.
- Latulus sayi* (Fitch). A common species of meadows and pastures.
- Latulus misellus* (Ball). Found in most places where collecting was done. Common in meadows and sterile pastures.
- Polyamia oblecta* (Osborn and Ball). Durham, September 21, 23, 1922, July 18, September 11, 1923; Rumney, September 28, 1927. From dry upland pasture and from dry meadow.
- Polyamia compacta* (Osborn and Ball). Durham, July 17, September 11, 23, 1922, July 1, 18, 1923, September 15, 1924; Hill, July 23, 1923. Taken in dry pastures.
- Polyamia apicata* (Osborn). Durham, September 8, 1921, July 11, 14, 17, September 8, 11, 1922, July 1, 5, 18, 1923; Webster, July 18, 1900 (W. F. F.). Taken in dry pastures.
- Polyamia capevata* (Ball).—(*vinnulus* Crumb). Durham, September 15, 1924, on Andropogon in sandy pitch pine area.
- Polyamia inimica* (Say). Common throughout the state in meadows and pastures.
- Laevicephalus melsheimerii* (Fitch). Durham, July 7, 20, August 30, September 7, 8, 25, 28, 1922, July 1, 5, 18, September 11, 1923; Farmington, July 6, 1923; Hill, July 23, 1923; Lee, June 28, 1928; Mt. Washington, reported for alpine region (A. T. S., 1898); Wonolancet, June 20, 1930. A common species in dry pastures.
- Laevicephalus unicoloratus* Gillette and Baker. (*oculatus* O. & B., *nominatus* S. & DeL.). Durham, September 1, 21, 1922, July 2, 5, 1923, June 13, 1930; Farmington, July 6, 1923, October 2, 1927; New Hampshire, recorded by D. M. D., 1926; Newmarket, August 31, 1922; Webster, August 4, 1898 (W. F. F.). From dry pastures.
- Laevicephalus sylvestris* (Osborn and Ball). Durham, September 21, 1922, August 11, 1923; Fabyans, July 24, 1900 (W. F. F.); Rochester, July 10, 1930; White Mountains, July 30, 1900, from summit Mt. Clinton (W. F. F.).
- Laevicephalus acus* (Sanders and DeLong). Concord, August 12, 1929; Durham, August 29, September 8, 1922, July 1, August 11, 1923; Franconia, August 2, 1930; Hill, July 23, 1923; Isles of Shoals, July 23–28, 1927; Nottingham, September 4, 1927. Common in dry upland pastures.
- Laevicephalus pascuellus* (Fallen). Durham, September 8–October 3, 1921, July 7–October 28, 1922, June 23, 1923, September 1, 1924, August 15, 1926; Fabyans, September 2, 1928; Mt. Washington, reported for alpine region (A. T. S., 1906); North Hampton, September 13, 1922; Portsmouth, September 3, 1922; Rye, June 30, 1928; Wonolancet, June 20, 1930. Common in meadows, pastures, and swampy areas.
- Laevicephalus abdominalis* (Fabricius). Reported for State (D. M. D., 1926); Twin Mountain, July 28, 1900 (W. F. F.).

- Laevicephalus debilis* (Uhler). Fabyans, July 24, 1900 (W. F. F.); reported from State (D. M. D., 1926); Twin Mountain, July 28, 1900 (W. F. F.).
- Laevicephalus littoralis* (Ball). Durham, September 7, 1927. In salt marsh.
- Laevicephalus striatus* (Linnaeus), (*affinis* G. & B.). Durham, June 5, 1922, September 23, 1922; Isles of Shoals, July 23–28, 1929; White Mountains, July 26, 30, 31, 1900, from summit of Mt. Clinton (W. F. F.).
- Amplicephalus simplex* (Van Duzee). Durham, September 1, 1924. From *Spartina*, salt marsh.
- Deltocephalus flavicostus* (Stal). Durham, July 18, 1923, swept from dry hilltop pasture, closely grazed.
- Deltocephalus pulicarius* (Fallen). Mt. Washington (base), September 7, 1920 (L. W. S.).
- Deltocephalus balli* Van Duzee, September 23, 1922.
- Aconura acuticauda* (Baker). Durham, July 17, 20, September 8, 1922, May 17, July 1, 18, 1923, September 6, 15, 1924; Farmington, July 6, 1923; Hill, July 23, 1923; Webster, July 18, 1900 (W. F. F.); Wonolanset, June 20, 1930. Common in dry sandy pastures.
- Driotura gammaroides* (Van Duzee). Durham, September 1, 1922, July 18, 1923, May 22, July 6, 1925; Lee, August 7, 1930. Common in pasture.
- Drylix striolus* (Fallen). North Hampton, July 16, 1930. Common in salt marsh among grasses and sedges.
- Euscelis extrusus* (Van Duzee). Reported for State (O. & B., 1902); Hanover, July 8, 1908 (C. W. J.); Mt. Washington (near base), July 24, 1900 (W. F. F.).
- Euscelis alpinus* (Ball). Recorded for State in Van Duzee's Cat. Hem.
- Euscelis obsoletus* (Kirschbaum)—Ball says: *deceptus* S. & DeL. = *relativus* G. & B. = *obsoletus* Kirschbaum. Mt. Washington (base), September 7, 1920 (L. W. S.).
- Ophiola uhleri* (Ball). Durham, August 1, 1898, swept from goldenrod (W. F. F.), June 28, 1900, from trap lantern (W. F. F.), July 18, 1923; Hanover, July 28, 1892 (C. M. W.), July 8, 1908 (C. W. J.); reported for State (O. & B., 1902).
- Ophiola anthracina* (Van D.). Hanover, July 8, 1908 (C. W. J.).
- Ophiola cuneata* (Sanders and DeLong). Durham, September 8, 22, 1921, July 7–October 2, 1922, July 1, 9, 1923; Hill, July 23, 1923; North Hampton, September 13, 1922; Portsmouth, September 3, 1922; Lee, August 7, 1930. Common in wet meadows.
- Ophiola arctostaphyli* (Ball). Mt. Washington, reported for alpine region (A. T. S., 1902), (O. & B., 1902), September 3, 1925, 6,200 ft. (Det. E. D. B.).
- Ophiola humida* (Osborn). Durham, September 23, 1922, August 28, September 4, 19, 1924; Jackson, September 18, 1927, (Det. E. D. B.). From bog shrubs.
- Ophiola striatula* (Fallen). Durham, September 23, 1922, July 1, 1923, August 28, September 4, 19, 1924; Isles of Shoals, July 23–28, 1929. Common in boggy areas.

- Ophiola comptoniana* Ball. Durham, September 10, 1921, September 21, 23, 1922, July 18, September 11, 1923; Lee, August 12, 1930; Madbury, September 5, 1927; Ossipee, September 17, 1927; Rochester, July 10, 1930; Webster, August 4, 1898 (W. F. F.); Wonalancet, July 17, 1930. Common in heath-shrub association.
- Ophiola osborni* Ball. Durham, July 17, 1922, July 5, 1923, July 21, 1930; Jackson, September 18, 1927; Lee, August 7, 1930; Wonalancet, July 17, 1930. Common in dry shrubby area.
- Ophiola angustata* (Osborn). Mt. Washington, September 3, 1925, 6,200 ft. (May not this also be *plutonia*?)
- Ophiola corniculata* (Marshall). Mt. Washington, September 3, 1925, 6,200 ft.
- Commellus comma* (Van Duzee). Mt. Washington, reported for alpine region (A. T. S., 1902); reported for State (O. & B., 1902); Webster, July 18, 1900, in dry stubble field (W. F. F.).
- Amblysellus curtisii* (Fitch). Reported for State (O. & B., 1902); Durham, September 1, 1897 (W. F. F.), October 15, 1898 (W. F. F.), June 27, 1900 (R. A. C.), September 8, 26, 1921, July 7–October 3, 1922, June 23, July 5, 1923; Hanover, August 18, 1892 (C. M. W.); Haverhill, October 7, 1927; Waterville, October 2, 1898 (W. F. F.); Webster, August 1, 1898 (W. F. F.); White Mountains, July 31, 1900 (W. F. F.).
- Eutettix luridus* (Van Duzee). Durham, September 14, 21, 1922 (Det. E. D. B.). From oak.
- Eutettix marmoratus* (Van Duzee). Durham, September 15, 1921, August 30, 1922 (Det. E. D. B.); Ossipee, September 17, 1927 (Det. E. D. B.).
- Eutettix southwicki* Van Duzee. Ossipee, September 17, 1927, common on scrub oak on dry sandy hillside (Det. E. D. B.).
- Eutettix johnsoni* (Van Duzee). Alton, August 19, 1928; Durham, September 16, 1921, October 5, 1922, August 18, 1928; reported for state (Weed—coll.) (E. D. B., 1907); Nottingham, September 4, 1927; Webster, July 21, 1900 (W. F. F.); Wonalancet, July 17, 1930. Taken in damp forest or woods.
- Eutettix seminudus* (Say). Durham, July 11, 1922.
- Eutettix cinctus* Osborn and Ball. Durham, August 30, September 21, 1922, September 15, 1924; Newmarket, August 31, 1922. From scrub white oak at edge of woods.
- Phlepsioides graniticus* Osborn and Lathrop. Durham, September 21, 1922, September 6, 15, 1924, August 18, 1927; Lee, September. From pitch and red pine.
- Phlepsioides fuscipennis* Van Duzee. Durham, July 21, 1897, from salt marsh (W. F. F.).
- Phlepsioides collitus* Ball. Durham, July 11, 1898 (W. F. F.), September 8, 1921, July 7, August 30, September 1, October 5; Hill, July 23, 1923. From willow and blueberry.
- Phlepsioides irroratus* (Say). Common on grass in meadows, pastures; taken on willow and *cornus*.

- Phlepsius apertus* Van Duzee. Jefferson, September 18, 1927. From roadside grass.
- Phlepsius carolinus* Lathrop. Durham, August 29, September 21, 1922, September 13, 15, 1924, August 18, 1928; Farmington, October 2, 1927. From blueberry, pitch pine, Andropogon, etc.
- Phlepsius fulvidorsum* (Fitch). Durham, August 18, 1899 (R. A. C.), July 17–October 3, 1922, July 1, 1923; Franconia, August 2, 1930; Hill, July 23, 1923; Lee, September 9, 1928, August 7, 1930; Littleton, September 9, 1895 (C. M. W.); Nottingham, September 4, 1927; Portsmouth, September 3, 1922; Rochester, July 10, 1930; Webster, August 4, 1898 (W. F. F.).
- Phlepsius tullahomi* DeLong—*slossoni* var. *fastuosus* Ball (1927). Durham, September 13, 1921, September 6, 13, 15, 1924; Farmington, July 6, 1923; Webster, July 21, 1900 (W. F. F.). From birch, Andropogon, pitch pine barren, etc.
- Phlepsius franconianus* Ball—*P. strobi* (1927). Described (E. D. B., 1903) from male from Franconia collected (A. T. S.).
- Phlepsius strobi* (Fitch). Durham, July 3, 1924. From white pine (Det. E. D. B.).
- Phlepsius nebulosus* Van D. Durham, (H. O., 1905).
- Phlepsius solidaginis* (Walker). Durham, September 22, 1921, August 29, September 7, 11, 1922. From swamp grass.
- Phlepsius ramosus* Baker. Durham, July 7, 1899, in trap lantern (W. F. F.), September 1, 1924, September 7, 1927 (Det. E. D. B.). From salt marsh.
- Phlepsius bifidus* Sanders and DeLong. Portsmouth, September 3, 1922, from wet, bushy pasture.
- Phlepsius decorus* Osborn and Ball. Newmarket, August 31, 1922, from grass in open woods.
- Acinopterus acuminatus* Van Duzee. Durham, August 29, 1922, September 6, 13, 15, 1924, August 18, 1927, August 18, 1928; Nottingham, September 4, 1925. From pitch pine barren.
- Thamnotettix kennicotti* (Uhler). Durham, July 11, 1898 (W. F. F.), July 23, 1921, July 14–October 14, 1922, July 18, 1923; Mt. Washington, reported (A. T. S., 1895) alpine region; Lee, August 7, 1930; Rochester, July 10, 1930. From birch, Cornus, pitch pine and in low bushy pastures and meadows.
- Thamnotettix subcupraeus* (Provancher). Reported for State in Van Duzee's Cat. Hem.
- Thamnotettix morsei* Osborn. Durham, September 16, 1921, August 30, September 7, 23, 25, 1922. Swept from shrubs.
- Thamnotettix clitellarius* (Say). Durham, September 4, 1897 (W. F. F.), July 6–7, 1899 (R. A. C.), June 22, 28, 1900, in trap lantern (W. F. F.), June 27, 29, July 2, 1900 (R. A. C.), September 13–14, 1921, October 5, 1922, July 5, 9, 1923; June 27, 1924; Fabyans, September 2, 1928; Dover, July 19, 1922; Hill, July 23, 1923; Lee, August 7, 1930; Rye, July 6, 1928. From grass and bushes.
- Thamnotettix eburatus* Van Duzee. Mt. Washington (base), September 7, 1920 (L. W. S.).

- Thamnotettix belli* (Uhler). Durham, May 12, June 12, 24, 1925. Swept from underbrush in opening in white pine-hemlock woods.
- Thamnotettix belli* var. *brunneus* Osborn. Durham, July 8, 1922. Swept from bushes.
- Thamnotettix* n. sp. (Near *perspicillatus* O. & B., sent to and retained by E. D. B.; I called this *Eutettix auratus* Ball). Durham, September 21, 1922, September 6, 15, 1924. From pitch pine.
- Thamnotettix chlamydatus* (Provancher). Bretton Woods, July 27, 1913 (C. W. J.); Glen House, Pinkham Notch, July 15, 1915 (C. W. J.); Mt. Washington, Halfway House, July 4, 1914 (C. W. J.), 2,500 ft. (C. W. J.); White Mountains, July 24, 1900 (W. F. F.), near base of Mt. Washington.
- Thamnotettix melanogaster* (Provancher). Durham, October 15, 1898 (W. F. F.), September 8–26, 1921, July 7–October 2. Common in low wet pastures and meadows, July 1, 9, August 1, 1923; Lee, August 7, 1930. In tall swamp grass.
- Thamnotettix decipiens* Provancher. Durham, September 20, 1922, September 19, 1924, September 7, 1927. From low meadow, sedge, edge of salt marsh.
- Thamnotettix smithi* Van Duzee. Durham, September 21, 1922; Webster, July 17, 1900. From damp meadow.
- Thamnotettix fitchii* Van Duzee. Durham, September 1, 1924, from tall grass at tide mark in salt marsh.
- Thamnotettix inornatus* Van Duzee. Alton, October 2, 1927; Durham, September 13, 26, 1921, August 29–October 5, 1922; Fabyans, September 2, 1928; Haverhill, October 7, 1927; Lee, August 7, 1930. Common on tall grass in swamp, or in low wet meadows.
- Chlorotettix unicolor* (Fitch). Common in meadows, pastures and on swamp grasses.
- Chlorotettix spatulatus* Osborn and Ball. Durham, August 15, 16, 1899, August 29, 1922; Concord, August 12, 1929; Lee, August 7, 1930. From tall grass in swampy region.
- Chlorotettix tergatus* (Fitch). Durham, August 1, 1898 (W. F. F.), August 18, 1899 (R. A. C.), August 6, 1900 (W. F. F.), September 8–30, 1921, August 29–September 14, 1922, August 11, 1923; Lee, August 7, 1930. From coarse grass in low meadows, pastures, swamps, along streams.
- Chlorotettix galbanatus* Van Duzee. Durham, August 30, 1922, July 1, 1923; reported for White Mountains—Fiske.
- Chlorotettix balli* Osborn. Durham, July 17, 20, August 30, 1922, August 11, 1923, August 28, 1924, July 31, 1925.
- Chlorotettix lusorius* (Osborn and Ball). Durham, October 14, 1922; Mt. Washington, reported (A. T. S., 1906) for alpine region.
- Jassus olitorius* Say. Center Harbor, September 10, 1914 (C. W. J.); Barrington, August 22, 1897 (C. M. W.); Durham, August 1, 1898 (W. F. F.), July 29, August 9, 15, 1899 (R. A. C.), July 19, September 14, 1921, August 27, 29, 30, September 25, 1922, August 11, 1923; Exeter, August 10, 1927; Lee, August 7, 1930; Wilton, August 22, 1928. On grape, corn, shrubs.

- Paracoelidea tuberculata* Baker. Durham, September, 1899 (W. F. F.), August 30, 1922, September 21, 1922, September 6, 15, 1924, August 18, 1927; Newmarket, August 31, 1922. Common on pitch pine.
- Cicadula punctifrons* var. *repleta* Fieber. Hanover, July 21, 1892 (C. M. W.), July 6, 1908 (C. W. J.); Mt. Washington, reported for alpine region (A. T. S., 1897, 1902).
- Cicadula variata* (Fallen). Durham, June 28, 1900 (W. F. F.); Mt. Washington, near base, July 24, 1900 (W. F. F.); reported for alpine region (A. T. S., 1896).
- Cicadula lepida* Van Duzee. Durham, July 17, 1898 (W. F. F.), September 13, 1921, July 7–October 2, 1922, June 25, September 11, 1923; Nottingham, September 4, 1927. On *Impatiens*.
- Cicadula sexnotata* (Fallen). Common in meadows and pastures everywhere.
- Cicadula pallida* Osborn. Durham, September 23, 1922, June 28, September 4, 19, 1924; Spruce Hole, June 13, 1930. From bog herbs.
- Cicadula divisa* (Uhler). Mt. Washington, reported for alpine region (A. T. S., 1902).
- Cicadula slossoni* Van Duzee. Durham, September 8, 1921, July 8–October 2, 1922, July 9, 27, 1923; Mt. Washington, reported for alpine region (A. T. S., 1894), 6,200 ft., September 3, 1925; New Durham, October 2, 1927; Newmarket, August 31, 1922; North Hampton, September 13, 1922; Wonalancet, July 1, 1930. Common on *Juncus*.
- Balclutha punctata* (Thunberg). Common on grasses in meadows and pastures; also from grass in moist wood and from bog-herb zone.
- Balclutha osborni* Van Duzee. Mt. Clinton (near summit), July 31, 1900 (W. F. F.); White Mountains, from alpine summits of presidential range, July 26–28, 1900 (W. F. F.).
- Balclutha impicta* (Van Duzee). Durham, July 14–August 30, 1922, June 23, August 11, 1923; Hill, July 23, 1923; Mt. Clinton, near summit, July 30, 1900.
- Eugnathodus abdominalis* (Van Duzee). Dixville, September 9, 1930; Durham, September 16, 1921, July 14, September 7, 14, 1922; Hill, July 23, 1923; Isles of Shoals, July 22–28, 1929; Mt. Washington (near base), July 24, 1900 (W. F. F.); Raymond, July 13, 1930; Twin Mountain, July 28, 1900 (W. F. F.); Wonalancet, July 17, 1930, September 27, 1930.
- Alebra albostriella* var. *agresta* McAtee. Durham, July 14, 1922, August 11, 1923. From white oak (Det. W. L. M.).
- Alebra albostriella* var. *fulveola* (Herrick-Schaeffer). Durham, August 11, 1923, on white oak.
- Dikraneura mali* (Provancher). Chocorua Lake, September 1, 1928; Dixville, September 9, 1930; Durham, September 14, 22, October 3, 1921, June 5, July 11, 21, August 29, September 1, 8, 21, October 2, 1922, May 7, August 11, 1923; Lee, August 12, 1930; White Mountains, alpine summits, July 28, 1900 (W. F. F.).
- Dikraneura fieberi* (Loew). Common in meadows and pastures.

- Dikraneura abnormis* var. *urbana* Ball and DeLong. Durham, July 18, 20, 21, 1922, August 30, September 18, 1922; Hill, July 23, 1923; Newmarket, August 31, 1922; Wonalancet, July 17, 1930. Fairly common in moist meadow.
- Empoasca maligna* (Walsh). (*unicolor* (Gillette)). Apple Leafhopper. Durham, July 14, 20, 1922; Hill, July 23, 1923. On apple.
- Empoasca smaragdula* (Fallen). Durham, August 18, 1923, on willow.
- Empoasca obtusa* Walsh. Durham, September 14, 21, 1922, July 9, 1923; Mt. Washington, reported for alpine region (A. T. S., 1902).
- Empoasca unica* (Provancher). Durham, June 28, 1900, in trap lantern (W. F. F.), September 8, 22, 1921, July 7, August 30, 1922; Epping, June 27, 1898 (W. F. F.); Portsmouth, September 3, 1922; Webster, July 17-19, 1900 (W. F. F.). Common on alder.
- Empoasca atrolabes* Gillette. Durham, July 15, 17, 1898 (W. F. F.), August 29, 30, 1922, September 8, 1922, July 1, 1923; White Mountains, near base of Mt. Washington, July 24, 1900 (W. F. F.); Wonalancet, July 17, 1930. Common on alder.
- Empoasca* sp. (McAtee). Durham, September 22, 1921, August 30, September 21, 1922, July 18, 1923; Jackson, September 18, 1927. In dry bushy pastures.
- Empoasca pergandei* Gillette. Durham, September 14, 1921, July 18, 1923, September 7, 1927. On black locust. (Det. W. L. M.).
- Empoasca coccinea* (Fitch). Common on white and pitch pine.
- Empoasca fabae* (Harris). (*mali* (LeBaron)). Potato Leafhopper. Exeter, July 30, 1926; Lancaster, August 18, 1927; Madbury, September 8, 1927; Manchester, August 20, 1928. Potato.
- Empoasca birdii* Goding. Alton, October 2, 1927; Chocorua Lake, September 1, 1928; Durham, September 14, 1921, August 30, September 1, 7, 20, 25, October 14, 1922, May 9, 16, 20, 1925; Wonalancet, July 17, 1930.
- Eupteryx melissae* Curtis. Durham, July 9, 1925; Wilton, October 22, 1927. Common on catnip.
- Eupteryx vanduzeei* Gillette. Durham, June 20, 1925; Hanover, July 8, 1908 (C. W. J.). Swept from ferns in white pine-hemlock forest.
- Eupteryx flavoscuta* var. *flavoscuta* Gillette. Chocorua Lake, September 1, 1928; Durham, September 30, 1921, August 29, October 14, 1922, June 12, 1925; Dixville, September 9, 1930; Hill, July 23, 1923; Holderness, reported (C. P. G., 1898); Mt. Washington (2,500 ft.), July 28, 1915. Common on ferns in white pine woods.
- Eupteryx flavoscuta* var. *juvenis* McAtee. Newmarket, August 31, 1922.
- Eupteryx flavoscuta* var. *clavalis* McAtee. Durham, September 30, 1921, July 14, 1922. From common wood fern.
- Eupteryx flavoscuta* var. *nigra* Osborn. Dixville, September 9, 1930; Durham, September 30, 1921, July 14, September 25, 1922; Hanover, July 8, 1908 (C. W. J.). From wood ferns.
- Typhlocyba tenerrima* Herrick-Schaeffer. Mt. Washington, reported for alpine region (A. T. S., 1898), (W. L. M., 1926—"has been unable to verify the reported occurrence of this species in America"). This is probably *T. unca* McA.

- Typhlocyba piscator* McAtee. Durham, June 23, 1923, (Det. W. L. M.).
- Typhlocyba unca* McAtee. Alton, October 2, 1927; Durham, September 8, 22, 30, 1921, August 30, September 7, 21, 1922, September 9, 1927 (Det. W. L. M.); Hill, July 23, 1923; Jackson, September 18, 1927; Mt. Washington (E. D. B.), male holotype (W. L. M., 1926). Common on alder.
- Typhlocyba rosae* (Linnaeus). Colebrook, September 9, 1930; Durham, September 13, 14, 15, 22, 1921, July 14, August 29, September 1, 11, 14, September 11, 13, 1923, August 20, October 3, 1924, September 25, 1925, September 7, 1927; Portsmouth, September 3, 1922. Common on roses, *Spiraea*, etc.; badly spotting apple leaves.
- Typhlocyba lethierryi* Edwards. Durham, September 9, 1927, (Det. W. L. M.).
- Typhlocyba lancifer* McAtee. Durham, July 5, 1923, from sugar maple, (Det. W. L. M.).
- Typhlocyba cymba* var. *cymba* McAtee. Alton Bay, July 27, 1930, in spider's web.
- Typhlocyba cymba* var. *pallens* McAtee. Chocorua Lake, September 1, 1928; Franconia, August 2, 1930, from red maple.
- Typhlocyba cymba* var. *unipuncta* McAtee. Jackson, September 18, 1927, (Det. W. L. M.).
- Typhlocyba cymba* var. *grata* McAtee. Mt. Washington (E. D. B.), recorded (W. L. M., 1926); Wonalcet, July 17, 1920.
- Typhlocyba gillettei* var. *gillettei* Van Duzee. Durham, July 17, 1898 (W. F. F.), July 5, 1899, at light (W. F. F.), June 21, 1900, from light (W. F. F.), September 30, 1921, July 14, September 7, (Det. W. L. M.), 1922, August 11, 1923, September 9, 1927; Glen to Halfway House, White Mountains, July 8, 1891 (U. S. N. M.); Mt. Washington, reported for alpine region (A. T. S., 1896), (E. D. B., U. S. N. M.) and Waterville, July 17, 1906 (W. L. M., 1926); Nottingham, September 4, 1927; Ossipee, July 11, 1929. Fairly common on white oak and alders nearby.
- Typhlocyba gillettei* var. *suffrana* McAtee. Mt. Washington (E. D. B.), male holotype described from this locality (W. L. M., 1926).
- Typhlocyba gillettei* var. *casta* McAtee. Nottingham, September 4, 1927.
- Typhlocyba gillettei* var. *venusta* McAtee. Fabyans, September 2, 1928. From alder.
- Typhlocyba pomaria* McAtee. Durham, August 27, 1922, (Det. W. L. M.), August 21, 1924, (Det. W. L. M.), October 24, 1927, adults fairly common on apple; leaves show considerable white stippling; Wilton, August 11, September 30, October 22, 1927. Common on apple.
- Typhlocyba arsinoe* McAtee. Durham, August 30, 1922, (Det. W. L. M.).
- Typhlocyba nitidula* Fabricius. Mt. Washington, reported for alpine region (A. T. S., 1906). (W. L. M., 1926—"in the present study no species of the true *nitidula* has been found, and it is suggested that the Slosson record may be based on one of the varieties of *T. gillettei* or *T. cymba*.")

- Typhlocyba modesta* Gibson. Alton, October 2, 1927, (Det. W. L. M.); Jackson, September 18, 1927, (Det. W. L. M.).
- Erythroneura vulnerata* var. *vulnerata* Fitch. Durham, September 26, 1921, August 29, September 20, 1922, July 18, 1923, (Det. W. L. M.), September 13, 1923. On woodbine, grape.
- Erythroneura niger* (Gillette). Durham, May 7, 1923.
- Erythroneura obliqua* (Say). Common on underbrush in woods.
- Erythroneura obliqua* var. *eluta* McAtee. Durham, August 30, 1922.
- Erythroneura obliqua* var. *dorsalis* (Gillette). Durham, September 13, 14, 1921, (Det. W. L. M.), August 30, September 25, 1922. Taken from underbrush.
- Erythroneura obliqua* var. *stolata* McAtee. Durham, September 16, 1921, September 21, 25, October 14, 1922, (Det. W. L. M.).
- Erythroneura obliqua* var. *parma* McAtee. Durham, September 25, 1922, March 23, 1924, (Det. W. L. M.); Rochester, July 10, 1930, on blueberry.
- Erythroneura obliqua* var. *noevus* (Gillette). Durham, September 1, 1922, September 19, 1924.
- Erythroneura obliqua* var. *fumida* (Gillette). Durham, September 25, August 30, October 14, 1922, (Det. W. L. M.), September 19, 1924, May 12, 1925, (Det. W. L. M.).
- Erythroneura obliqua* var. near *clavata* DeLong. Durham, September 8, 23, 1922, August 28, September 4, 1924. Swept from bog shrubs where *Kalmia angustifolia* was dominant shrub.
- Erythroneura abolla* var. *varia* McAtee. Durham, September 14, 1921, (Det. W. L. M.), August 27, September 17, 1922, (Det. W. L. M.), September 7, 1927, (Det. W. L. M.). One yellow form from elm.
- Erythroneura abolla* var. new. Durham, September 16, 1921, August 30, 1922, May 12, 16, 1925; Mt. Washington, July 24, 1925, 2,500 ft. (C. W. J.).
- Erythroneura tecta* var. *carbonata* McA. Durham, September 22, 1921, (Det. W. L. M.), September 7, 11, 1922, (Det. W. L. M.).
- Erythroneura scutelleris* (Gillette). Durham, September 7, 1927, from American elm, (Det. W. L. M.).
- Erythroneura basilaris* var. *basilaris* (Say). Durham, September 8, 1922, (Det. W. L. M.).
- Erythroneura maculata* var. *maculata* (Gillette). Common on underbrush.
- Erythroneura maculata* var. *bigemini* McAtee. Durham, July 9, 1923, on willow.
- Erythroneura maculata* var. *gemina* McAtee. Durham, September 13, 14, 1921, July 8, October 2, 1922, August 21, 1924, (Det. W. L. M.); Dixville, September 9, 1930. Common on field and roadside shrubs.
- Erythroneura vitis* var. *vitis* (Harris). Durham, August 29, September 11, 1923, (Det. W. L. M.), September 13, 1923, on grape.
- Erythroneura tricincta* var. *tricincta* Fitch. Mt. Washington, reported for alpine region, (A. T. S., 1902).

- Erythroneura comes* var. *comes* (Say). Durham, September 3, 16, 1921, August 29, September 11, 1922, September 13, 1923; Wilton, October 22, 1927. Common on grape.
- Erythroneura comes* var. *vitifex* Fitch. Alton, October 2, 1927, (Det. W. L. M.); Durham, September 8, 1923, (Det. W. L. M.), June 12, 1925. On blueberry and shrubs.
- Erythroneura comes* var. *elegans* McAtee. Durham, September 26, 14, 1921, (Det. W. L. M.), July 18, 1923. Common on woodbine.
- Erythroneura comes* var. *ziczac* Walsh. Durham, September 26, 1921. From woodbine.
- Erythroneura comes* var. *rubra* (Gillette). Durham, September 7, 1922, June 24, 1925, September 13, 1923, on grape; Pinkham Notch, Glen House, June 11, 1916 (C. W. J.).
- Erythroneura comes* var. *rubrella* McAtee. Durham, September 14, 15, 16, 1921, August 27, September 1, 7, 14, 20, 1922, May 7, August 11, 1923, (Det. W. L. M.), September 29, 1927, on *Cornus*, (Det. W. L. M.); Rochester, July 10, 1930, on blueberry.
- Erythroneura comes* var. *nudata* McAtee. Durham, September 13, 1923, on grape associated with var. *comes*.

REFERENCES.

- Ball, E. D. Ann. Ent. Soc. Am., xiii, 142, 1920.
 Jour. Ec. Ent., xvii, 598, 1924.
 Proc. Ia. Acad. Sci., viii, 53, 1901; xii, 67, 1907.
 Can. Ent., xxxv, 238, 1903.
- DeLong, D. M. O. S. U. Studies 2, No. 13, p. 42, 1926; Bull. 23, No. 15, p. 13, 1919.
- Gillette, C. P. Proc. U. S. Nat. Mus., xx, 749, 1898.
- McAtee, W. L. Proc. U. S. Nat. Mus., lxviii, Art. 18, 6, 1926.
- Osborn, H. Jour. Cincinnati Soc. Nat. Hist., xix, 201, 1900.
 20th Rept. St. Ent. N. Y., 532, 1905.
 Ohio Nat., xi, No. 3, 258, 1911.
 Me. Agr. Exp. Sta. Bul. 238, 116, 1915.
 Rep. Ia. Acad. Sci., iv, 200, 1897.
- Osborn, H., and Ball, E. D. Proc. Dav. Acad. Nat. Sci., vii, 48, 1898, vii, 134, 1898.
- Slosson, A. T. Ent. News, v, 5, 1894; vi, 5, 1895; vi, 321, 1895; vii, 265, 1896; viii, 240, 1897; ix, 251, 1898; xiii, 8, 1902; xiii, 321, 1902; xvii, 326, 1906.
- Van Duzee, E. P. Ent. Am., vi, 227, 1890.
 Cat. Hem., 1917.

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